

**REMARKS**

Claims 1-30 are pending in the present application.

**I. FORMAL MATTERS**

Applicant notes with appreciation that the Examiner has found claims 5, 7-9, 13, 15-17, 22 and 24-26 to be allowable if rewritten in independent form, and to overcome the rejection under 35 U.S.C. § 112, second paragraph. Applicant respectfully submits that the Office Action does include any rejection under 35 U.S.C. § 112, second paragraph. Therefore, the claims should be allowable in their present form. Because the present invention is patentable over the applied prior art, as presented below, Applicant has not rewritten these claims in independent form.

Applicant notes with appreciation the Examiner's indication that the drawings filed on July 3, 2001 are acceptable.

Applicant notes with appreciation the Examiner's acknowledgement of the claim to foreign priority under 35 U.S.C. § 119(a)-(d) or (f) and indication that the certified copies of the priority documents have been received.

Applicant notes with appreciation the Examiner's inclusion in the Office Action of a copy of the PTO Form 1449 that was submitted with the Information Disclosure Statement filed on July 3, 2001. The references listed therein are initialed by the Examiner, thereby indicating that these references were considered by the Examiner, and should be listed on the face of any patent that issues from the present application.

## II. DESCRIPTION OF SOME FEATURES OF THE PRESENT INVENTION

The present invention has an objective to offer a drive circuit, for use in a liquid crystal display, that is applicable to electronics that includes an adjusting circuit running on a reduced power supply for adjusting the potential differences between pixel electrodes and a common electrode and to further offer a liquid crystal display incorporating the drive circuit and electronics incorporating the liquid crystal display (see the specification, page 9, lines 2-11).

While maintaining the potential differences between the middle values of grayscale level voltages, the DC levels are all shifted by the "voltage level altering means for shifting voltage levels of the source signals

supplied by the source driver equally for all the pixel electrodes" set forth in independent claims 1, 12, 21.

As a result, in the drive circuit for a liquid crystal display in accordance with the present invention, the electric potential of the common electrode can be fixed. This eliminates the need for a conventionally required clamp circuit with a voltage adjusting resistor and saves the power consumption by the clamp circuit. In addition, the clamp circuit and the capacitor are no longer required; the drive circuit becomes applicable in low frequency drive and suspension drive (see the specification, page 10, line 12 to page 11, line 4).

### III. PRIOR ART REJECTION

Claims 1-4, 6, 10-12, 14, 18-21, 23 and 27-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,307,681 (Aoki). This rejection is traversed.

The Examiner, relying on column 5, lines 11-18, column 24, lines 13-17, and Fig. 1, asserts that Aoki teaches a three-terminal type switching element corresponding to the drive circuit supplying source signal from the source driver to pixel electrodes through switching by

means of thin film transistors according to a scan signal from a gate driver. The Examiner also asserts that Aoki teaches that the difference in potential from data line to data line is eliminated prior to the writing of the image signal, the potentials at the data lines are substantially equalized and the luminance non-uniformity and chrominance non-uniformity are thus compensated for. The Examiner admits that Aoki does not teach shifting voltage levels of the source signals supplied by the source driver equally for all of the pixel electrodes. The Examiner asserts that Aoki teaches that the supply amount of charge precharged at the data lines is adjusted by changing the precharge signal waveform when manufacturing variations make voltage luminance.

The Examiner asserts that it would have been obvious to modify the supply amount of charge precharged at the data lines by changing the precharge signal waveform to achieve the function of shifting voltage levels of the source signals supplied by the source driver equally for all of the pixel electrodes because this would provide an electro-optical that controls the generation of a non-uniformity in luminance.

Aoki teaches a method of driving an electro-optical apparatus that controls the generation of a non-uniformity in luminance or a chrominance non-uniformity caused by parasitic capacitance or wiring

resistance in the supply path of a precharge signal to a data line (see column 4, lines 6-12). Aoki teaches to change continuously the potential value of a precharge signal within a predetermined time period so that the potential level of the precharge signal remains substantially constant. The precharge circuit of Aoki is a circuit that supplies the data line with a precharge signal (preliminary charging signal) prior to the timing at which the data line driving circuit supplies the image signal to the data line via the sampling circuit, with the purpose of enhancing a contrast ratio, stabilizing the potential level of the data line, and reducing on-screen line non-uniformity. The precharge operation helps reduce the load of the data line driving circuit when it writes the image signal to onto the data line (col. 1, lines 46-55).

As admitted by the Examiner, Aoki fails to teach or suggest to shift voltage levels of the source signals supplied by the source driver equally for all of the pixel electrodes. That is, Aoki fails to teach or suggest the claimed voltage level altering means of independent claims 1, 12 and 21. The Examiner fails to cite a prior art reference that teaches this feature admittedly not taught by Aoki. Therefore, the Examiner has failed to form a *prima facie* case of obviousness. In order to form a *prima facie* case of obviousness, the Examiner must cite prior art that teaches or suggests all of the claim features (see MPEP § 2143.03, *In re Royka*, 490

F.2d 981, 180 USPQ (580 CCPA 1974)). Thus, Applicant submits that the rejection is improper and should be withdrawn.

The present invention differs from Aoki et al. in the function of the voltage level altering means as follows.

(i) Aoki et al. continuously or gradually vary the precharge video signals to improve image quality and does not shift the signals equally.

This is demonstrated in PV1, PV2 in Figures 12, 13, 18 of Aoki et al.

(ii) In contrast, in the present invention, regarding the outputs in Figure 1, a set of DC or short waves are shifted by equal amounts. The shifted outputs are supplied to Figure 4, in order to alter the voltage levels of the source driver outputs by equal amounts relative to the input data.

Further, Applicant submits that the Examiner has not properly shown a suggestion or motivation to so modify Aoki. Because Aoki teaches a device that controls the generation of non-uniformity in luminance, there is no need to modify the device of Aoki to control the generation of non-uniformity in luminance, as asserted by the Examiner, since the device of Aoki already does this. Therefore, Applicant submits that the Examiner also has failed to show a suggestion or motivation to so modify Aoki, further demonstrating that the Examiner has failed to form a *prima facie* case of obviousness.

Applicant submits that the sections of Aoki relied on by the Examiner (column 5, lines 11-18, column 24, lines 13-17, and Fig. 1) do not present any suggestion to shift voltage levels of source signals supplied by a source driver equally for all of pixel electrodes.

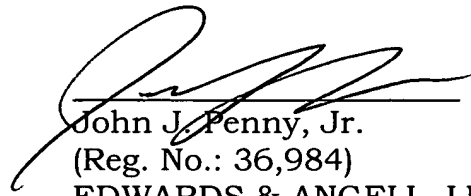
Thus, for the reasons presented above, Applicants respectfully submits that the rejection of claims 1-4, 6, 10-12, 14, 18-21, 23 and 27-30 under 35 U.S.C. § 103(a) is improper and should be withdrawn.

Based on the forgoing, Applicant submits that the present application is in condition for allowance and allowance is respectfully solicited.

Applicant believes that no additional fees are due for the subject application. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. 04-1105.

Respectfully Submitted,

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